**Geoscience methods applied to real-world problems**

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Many students come into my Physical Geology course with the impression that they are going to be asked to memorize a long list of unfamiliar words and learn special facts about rocks. Most of the students enrolled in this large-enrollment lecture and lab course are taking it to fulfill a general science requirement rather than planning to major in geoscience. Few of them know much about geoscience coming into the course. My hope is that by the end of the term they will feel that they have learned how observation, measurement and modeling allow geologists to solve problems and answer questions. I also want students to recognize that some of the problems that geologists take on are very “relevant” to everyone on earth – not just geologists. Problems such as risks of earthquakes, volcanic eruptions and energy and mineral resource utilization.

I am always trying to add to my quiver of interesting geology-based examples of how the process of science works. Characteristics that make engaging examples seem to be one with relevance to regional issues. A few examples are problems involving the contamination, primarily of surface and groundwater, that is the legacy of mining in Montana (such as the example activity included here); energy resource issues, such as coal, oil and gas extraction, “fracking,” and using oil sands; and prediction of earthquakes and volcanic eruptions in the Pacific Northwest and Yellowstone region. I also like issues with global relevance such as the implications of changes in behavior of the Greenland Ice Sheet, or using paleogeographic reconstruction to understand why the Middle East has such vast oil and gas deposits. When students can see the application of knowledge to problems, they can begin to build an understand of what geoscientists – and other types of scientists – really do and what makes them passionate about science.